

## **REMARKS/ARGUMENTS**

In the Office action dated November 10, 2005, the Examiner rejected claims 1, 4, 6 and 11 under 35 U.S. C. § 102(e) as being anticipated by U. S. Patent No. 6,795,418 B2 of Choi. claims 2, 3, 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over '418 in view of U.S. Patent Publication No. 2002/0131414 A1 of Hadzic. Claim 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over '418 in view of U. S. Patent No. 6,442,164 B1 of Wu. Claim 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over '418 in view of '164 and further in view of '414. Claims 5 and 12 were objected to as being dependent on a rejected base claim, but indicated as allowable if presented in independent form.

In the Specification, no changes.

In the Claims, claims 1 and 6 are amended. New claims 13 - 17 are presented. Claim 13 includes the limitations of originally presented claims 6 and 12.

### **The Invention**

As noted in the Specification as filed: The scheduler of the invention interfaces with the 802.11e bandwidth manager (BM), and the 802.11e stream manager (SM). The invention is directed towards a carrier sense multiple access/collision avoidance (CSMA/CA) asynchronous communication protocol, which is a contention based protocol, *i.e.*, more than one station may attempt to transmit at a time, and some mechanism is needed to prevent data collisions, and to "repair" corrupted data in the event of a data collision. Upon the admission of a flow, or stream, the bandwidth manager generates, and transmits a TSPEC. A TSPEC is an object that represents QoS objectives related to a given flow of data from one to one or more Enhanced Stations (ESTAs). The scheduler of the invention includes a mechanism for governing

channel resources in the local area network, including a transmit specification controller.

The scheduler allocates TXOPs, as needed, to STAs whose flows have been established and granted TSPECS. For all stations with admitted flows, before the start of every Superframe, a set of TXOPs are allocated to each station corresponding to each flow. These TXOPs are made known to the individual ESTAs granted the TXOPs through QoS + coordination function polls (CF-Polls) that are sent. The scheduler of the invention includes a TXOP mechanism for terminating transmits opportunities for stations which have successfully completed data transmission, thereby changing the length of a Superframe

These CF-Polls provide information in the QoS Control Field of the header (§§ 7.2.2 and 7.1.3.5 of IEEE 802.11e) which the ESTAs can use to send one or more MAC Service Data Units (MSDUs), not exceeding duration of the TXOP limit. The Examiner is directed to the IEEE 802.11e website for a full explanation of the 802.11e standard, which is well understood by those of ordinary skill in the art, and which is required to place the instant invention and the claims therefore in proper context.

During each Superframe, polls are sent. The Hybrid Coordinator (HC) listens for responses from CF-Polls. Upon the acknowledgment of reception of data transmitted, or reception of data when the HC is the intended recipient, the HC updates counters indicating successful transmission. This allows queue sizes to be estimated. The foregoing is actually performed by the stream/BW management entities and not by the scheduler. The scheduler's function is merely to schedule, and to recover data when polls are incorrectly received, or when TXOPs are prematurely terminated.

### **The Applied Art**

U. S. Patent No. 6,795,418 B2 to Choi is directed towards an *ISOCHRONOUS* MAC protocol in a non-contention-based protocol. col. 4, lines 35-45. '418 utilizes token-passing as a means of controlling traffic on the LAN.

U.S. Patent Publication No. 2002/0131414 A1 of Hadzic describes an Ethernet network, which is not a CSMA/CA network.

U. S. Patent No. 6,442,164 B1 to Wu describes asynchronous transfer mode (ATM) is a connection-oriented packet-switching technology in which information is organized into small, fixed length cells. ATM carries data asynchronously, automatically assigning data cells to available fixed-length time slots on demand to provide maximum throughput.

### **The Claims**

Claim 1 has been amended to correct a typographical error and to clarify that the LAN of the invention is a CSMA/CA, asynchronous, contention-based LAN. One of ordinary skill in the art would understand that protocols used in '418 are not applicable to such a system, as '418 describes an isochronous, non-contention-based protocol. It is apparent that the Examiner also understands this. See page 2, § 2 of the office action. The Examiner, on page 2, § 2 of the Office action, describes the operation of the LAN of '418, however, none of the features set forth by the Examiner are present in Applicant's claims. On page 3 of the Office action, the Examiner does state language found in the claims insofar as the transmit specification is concerned, however, the applied portion of '418, *e.g.*, Col. 4, lines 39-45, describes a transmit specification for a network frame in an isochronous MAC protocol, which is not applicable to a CSMA/CA asynchronous network, as described and claimed by Applicant. This is well understood by those of ordinary skill in the art.

The Examiner goes on to compare the EOF data of '418 to the TXOP of the claimed invention. This is not correct. EOF data is part of the 802.11 standards; TXOP is unique to the scheduler and method of the invention: TXOP and the TXOP mechanism are operable to change the length of the superframe of the invention. '418 uses the EOF to allow use of a time slot by another station, but does nothing to change the length of the timeslot as does the TXOP of the invention.

So, the applied art is not directed towards a CSMA/CA, asynchronous, contention-based LAN; it directed towards and isochronous LAN. The applied art does not teach nor suggest anything comparable to Applicant's TXOP mechanism. For these reasons, claim 1 is allowable over the applied art.

Claim 2 requires a buffer size predictor. The Examiner erroneously applies '414 to this feature of Applicant's invention. The reasoning seem to be that because '414 suggests using queuing theory and a random number generator to determine buffer size, it is obvious to use the transmit specification to determine buffer size. However, there is no random number generator in Applicant's transmit specification, nor is queuing theory used. There is no teaching nor suggestion in '414 to use the transmit specification to determine buffer size, other than the Examiner's contention, which is based solely on Applicant's teaching. Claim 2 is clearly allowable over the applied art.

Claim 3 requires that the buffer size predictor of claim 2 minimize buffer size. Again, the applied art requires determination of a buffer size but a method completely different from that taught by Applicant, and the only suggestion that the buffer size predictor minimize the buffer size comes from the Examiner, not from the applied reference. Claim 3 is allowable over

the applied art.

Claim 4 requires that the TXOP mechanism expand and contract the TXOP duration. The Examiner applies '418 as a 102 reference in rejecting this claim, however, as previously noted, '418 does not have the capability of changing the length of preset transmission slots, superframes, *etc.*: '418 merely allows a station to transmit in an existing, fixed-length slot when another station finishes transmitting in the slot. This is plainly stated in the applied portion of '418, namely, col. 6, lines 24-32. Claim 4 is allowable over the applied art.

Claim 5 was objected to, however, as claim 1 has been shown to be allowable, claim 5 is also allowable.

Claim 6 is a method claim corresponding to claim 1's apparatus, and is allowable for the reasons set forth in connection with claim 1.

Claims 7 and 8 are allowable for the reasons set forth in connection with claims 2 and 3, respectively.

Claim 9 recites that prediction of the buffer size is a function of the expected required throughput. Claim 9 is allowable with its allowable parent claim.

Claim 10 is allowable for the reasons set forth in connection with claim 3.

Claims 11 and 12 are allowable for the reasons set forth in connection with claims 4 and 5, respectively.

New claim 13 is a combination of claim 6 and claim 12 and is allowable over the prior art of record.

New claims 14 - 17 are allowable for the reasons set forth in connection with claims 7 - 10, respectively.

In light of the foregoing amendment and remarks, the Examiner is respectfully requested to reconsider the rejections and objections stated in the Office action, and pass the application to allowance. If the Examiner has any questions regarding the amendment or remarks, the Examiner is invited to contact the undersigned.

**Provisional Request for Extension of time in Which to Respond**

Should this response be deemed to be untimely, Applicants hereby request an extension of time under 37 C.F.R. § 1.136. The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any over-payment to Account No. 22-0258.

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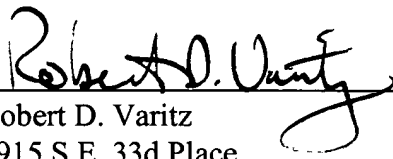
Respectfully Submitted,

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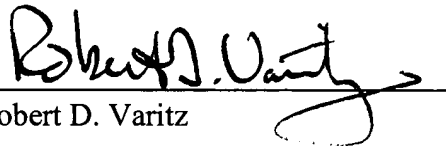
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I hereby certify that the attached RESPONSE TO OFFICE ACTION UNDER 37 C.F.R. § 1.111 is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to:

MS Amendment  
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